

AMENDMENT TO THE CLAIMS

1. (canceled)

2. (currently amended) A robotic tube handler system comprising:

a robotic tube handler having:

a housing with a perimeter rectangular frame having sides;

a bed in the perimeter frame for ~~orthogonal~~ orthogonal placement of tube racks, the bed having a seating structure in which ~~standard~~ tube racks of identical size seat in a predefined array;

a tube pick-up mechanism having:

a crossbar transport unit with tracks on two opposite sides of the frame;

a cross beam with two post supports wherein the cross beam spans ~~spanning~~ the bed ~~wherein and~~ the two post supports engage the tracks;

a transport assembly with a motor and a drive assembly in engagement with each of the post supports with ~~for~~ fore and aft transport of the crossbar transport unit on operation of the motor;

an elevator carriage supported on the cross beam with a transport mechanism having a motor and a drive assembly in engagement with the cross beam with ~~for~~ side to side transport of the elevator carriage on the cross beam on operation of the motor;

an elevator assembly;

a pick head unit wherein the elevator assembly has a transport mechanism with a motor that vertically displaces the pick head unit on

operation of the motor, the pick head unit having an actuatable pick head; and,
a controller with a control unit having electronics
operationally connected to the drive motors for precision control of X, Y, Z motion
of the pick head unit and actuation of the pick head for select engagement and
precision transport of tubes in tube racks seated in the bed.

3. **(currently amended)** The robotic tube handler system of claim 2 wherein the
housing has a platform with a parking holder for placement of a limited number
of tubes, ~~typically when~~ during sorting operations.

4. **(currently amended)** The robotic tube handler system of claim 2 wherein the
housing has a platform with a shuttle holder for placement of a limited number of
tubes, ~~typically~~ wherein the shuttle holder has a transport mechanism that
displaces the shuttle holder when transferring tubes to another adjacent robotic
tube handler.

5. **(currently amended)** The robotic tube handler system of claim 2 in
combination with tubes having a bottom with an identification element wherein
the housing has a platform with an identification station that verifies the identity
of a discrete tube, wherein the identification station is located on the platform at a
location accessible by the pick head unit and the identification station has an
upwardly directed sensor that senses the identification element of a tube
positioned over the sensor by the pick head.

6. **(previously presented)** The robotic tube handler system of claim 5 wherein the
identification station has a barcode reader.

7. **(previously presented)** The robotic tube handler system of claim 5 wherein the identification station has a RFID reader.

8. **(currently amended)** The robotic tube handler system of claim 2 including a tube fill unit wherein the pick head unit on the transport mechanism of the elevator assembly ~~is replaceable with a~~ and the tube fill unit are exchangeable.

9. **(currently amended)** The robotic tube handler system of claim 2 wherein the pick head of the pick head unit has a pick head for selectively picking a single tube from a tube rack, the pick head having four rigid pick fingers that spread when actuated, the pick fingers being configured to selectively and releasably engage a single tube in a rack.

10. **(previously presented)** The robotic tube handler system of claim 2 wherein the system includes racks that have a marking on the rack and the tube handler has a marking reader that reads the marking on the rack and identifies the rack.

11. **(canceled)**

12. **(currently amended)** The robotic tube handler system of claim ~~11~~ 9 wherein the four pick fingers are slender and configured to drop into the four spaces of closely spaced matrix arranged tubes.

13. **(canceled)**

14. **(canceled)**

15. **(canceled)**

16. **(currently amended)** The robotic tube handler system of claim ~~15~~ 12 wherein the pick head unit includes an actuator engaging the pick fingers.

17. **(previously presented)** The robotic tube handler system of claim 16 wherein the actuator has a cam device to spread and close the fingers.

18. **(previously presented)** The robotic tube handler system of claim 17 wherein the cam device is spring biased to close the fingers and, by a solenoid, actuated to open the fingers.